



# SPECTRUM OF CONGENITAL HEART DISEASES IN PATIENTS PRESENTING TO ECHOCARDIOGRAPHY DEPARTMENT: A FOUR-YEAR EXPERIENCE

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## ABSTRACT

**Background:** Congenital heart disease (CHD) is one of the major causes of mortality and morbidity in the pediatric population of both the developing and developed countries. **Aim:** Aim was to study the prevalence, age and sex wise distribution, and clinical spectrum of congenital heart disease in patients at Echocardiography department at a Tertiary care Hospital in Maharashtra India. **Methods:** This is a retrospective hospital based study carried out over a period of 4 years [January 2016 – December 2019] where all patients suspected with CHD were subjected to echocardiographic study. The age, sex and echocardiography findings were documented. **Results:** Echocardiography was done in 12,241 patients with suspected heart disease. Congenital heart diseases were diagnosed more commonly between 1 to 5 years of age. The commonest type of Acyanotic CHD in our study was ventricular septal defect (VSD) (33.33%) and cyanotic CHD is Tetralogy of Fallot (30.64%). **Conclusions:** In this era of most accurate diagnostic modalities, any clinical suspicion of congenital heart disease should be confirmed by echocardiography to hasten the diagnosis, timely management and prevention of complications.

**KEY WORDS:** Congenital heart disease, Echocardiography, Prevalence.

## INTRODUCTION:

Congenital heart disease (CHD) (con, together; genitus, born) is a group of gross structural abnormalities that are present at birth.

### Study Design:

We studied 12,241 total patients by doing clinical assessment, Oximetry, ECG and 2D Echocardiography with color Doppler in our hospital between January 2016 and December 2019 retrospectively. The usual presentation of patients was failure to thrive, breathlessness, cyanosis, presence of murmur, and arrhythmias.

805 patients were suspected with Congenital Heart Disease. Age group of patients ranged between birth and 40 years. 55.5% [446 patients] were males and 44.59% [359 patients] were females as depicted in Figure 1. 33.66% [271 patients] had normal Echocardiography. Heart disease was diagnosed in 66.33% [534 patients]. Congenital heart disease (CHD) was noted in 58.38% [470 patients]. Acquired Heart disease was noted in 7.9% [64 patients]. Among the CHD patients, Acyanotic Congenital Heart Disease (ACHD) was found in 86.80% [408 patients] and Cyanotic Congenital Heart Disease (CCHD) was noted in 13.19% [62 patients].

## RESULTS:

Prevalence of Heart disease in our study was 3.84%. Congenital Heart diseases were diagnosed most commonly between 1 year and 5 years of age [24.1%], followed by 1 month to 1 year of age [19.2%]. [Table 1] [Figure 2] Among the Acyanotic Congenital heart diseases, VSD was most common to be seen in 33.33% [136/408 patients], followed by ASD in 22.79% [93/408 patients] and PFO in 23.77% [97/408 patients]. [Table 2]

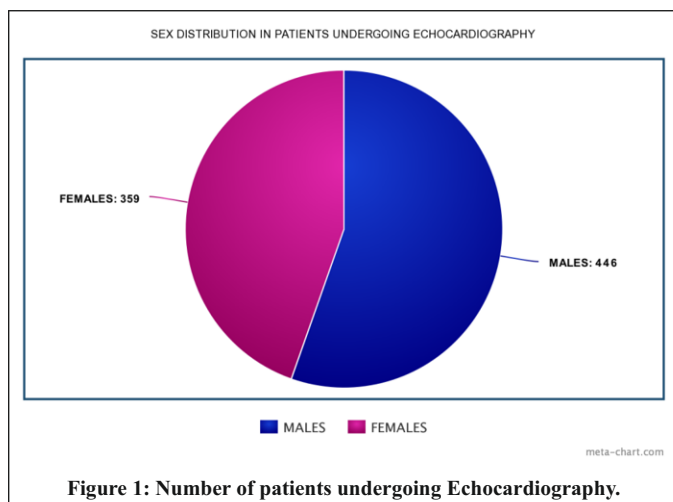


Figure 1: Number of patients undergoing Echocardiography.

Table 1: Age wise distribution of patients was as follows:

Age Group	Number of patients	Percentage
Less than 1 month	77	14.4
1 month to less than 1 year	103	19.2
1 year to 5 years	129	24.1
6 to 10 years	97	18.1
11 to 15 years	79	14.7
16 to 20 years	20	3.7
More than 20 years	29	5.4

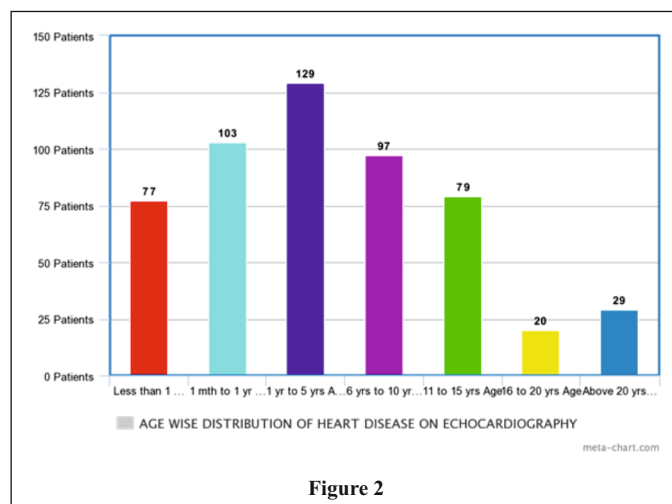


Figure 2

Table 2: Prevalence of various ACHD was as follows:

ACHD [ Total patients 408 ]	Number of patients	Percentage
VSD	136	33.3
ASD	93	22.7
PFO	97	23.77
PDA	32	7.8
Valvular Pulmonary Stenosis	20	4.9
Bicuspid Aortic Valve	11	2.6
Coarctation of Aorta	10	2.4
Cardiomyopathy	17	4.1
VSD DCRV	6	1.4

Dextrocardia	4	0.9
CCTGA	3	0.7
VSD closing by aneurysm formation	3	0.7
VSD with AR	2	0.4
Right Aortic Arch	2	0.4
Constrictive Pericarditis	2	0.4
Mitral Valve Prolapse	2	0.4
Sub Aortic membrane	1	0.2
Interrupted IVC	1	0.2
Double Aortic Arch	1	0.2
Gerbode shunt	1	0.2
Hypertensive Heart Disease	1	0.2
VSD + PAH	46	11.2
ASD + PAH	17	4.1
PDA + PAH	9	2.2
Rhabdomyoma	2	0.4
Ebstein's Anomaly	2	0.4

Common conditions associated with heart diseases were Thalassemia, Duchene's muscular dystrophy, Down's syndrome, Cleft lip and palate and SLE.

Cyanotic Congenital Heart diseases were noted in 62 patients. Most common CCHD were Tetralogy of Fallot in 30.64% [19/62 patients], followed by Transposition of great arteries in 9.6% [6/62 patients]. [Table 3]

**Table 3: Prevalence of various CCHD was as follows:**

CCHD [Total patients: 62]	Number of patients	Percentage
Tetralogy of Fallot	19	30.6
Transposition of Great Arteries	6	9.6
DORV	4	6.4
Tricuspid Atresia	3	4.8
Eisenmenger syndrome	2	3.2
Partial Anomalous pulmonary venous Return	5	8.0
Total Anomalous Pulmonary Venous return	1	1.6
Single ventricle	1	1.6
Infundibular pulmonary stenosis	17	27.4

Acquired Heart diseases were noted in 64 patients. Rheumatic Heart disease was noted among 32 patients. Kawasaki's disease was noted in 16 patients. Pericardial effusion was noted in 14 patients and Constrictive Pericarditis was noted in 2 patients.

Among the 534 patients with heart disease, successful catheterisation laboratory Interventions like Device closures, pericardial tapping and Balloon Valvuloplasties were done in 51 patients. No mortality was reported. Surgical correction of CHD was done in 12 patients.

## DISCUSSION

"The heart is the youngest, most diverse, most fluid, most changeable, most versatile part of creation."

Goethe<sup>1</sup>

Congenital heart disease (CHD) is the most frequently occurring congenital disorder, responsible for 28% of all congenital birth Defects.<sup>2,3</sup> Congenital heart disease (CHD) has been defined as a gross structural abnormality of the heart or intrathoracic great vessels that is actually or potentially of functional significance.<sup>4,5</sup> Congenital malformations of the heart and circulation are not fixed anatomic defects that appear at birth but instead are anomalies in flux that originate in the early embryo, evolve during gestation, survive the dramatic circulatory alterations at birth, and change considerably during extrauterine life.<sup>8,7</sup>

Considering birth prevalence as 9/1000, the estimated number of children born with CHD every year in India approximates 240,000, posing a tremendous challenge for the families, society and health care system.<sup>2</sup> Of these, about one-fifth are likely to have serious defect, requiring an intervention in the first year of life.<sup>2</sup> A recent systemic review reported the highest prevalence in Asia due to high birth rate and consanguineous marriages.<sup>5</sup>

According to CDC, at least 15% of CHDs are associated with genetic conditions.<sup>8,9</sup> About 20% to 30% of people with a CHD have other physical problems or developmental or cognitive disorders.<sup>10,11,12</sup>

According to recent update report of the American Heart Association, atrial septal defect (ASD), ventricular septal defect (VSD), Tetralogy of Fallot (TOF), Patent ductus Arteriosus (PDA), pulmonary stenosis, aortic stenosis, Coarctation of aorta, and atrioventricular septal defect accounts for 85% of all CHDs.<sup>5</sup>

Obstacles of Pediatric Cardiac Care in India are lack of awareness and delay in diagnosis, maldistribution of resources and financial constraints.<sup>2</sup>

With rapid advances in diagnosis and treatment of CHD, vast majority of children born with CHD in high-income countries reach adulthood.<sup>2,5</sup> In our study, 5.4% of patients with congenital heart disease were above 20 years of age.

Early detection of congenital heart disease is of paramount importance to improve the quality of life of children and prevent morbidity and mortality.<sup>13</sup>

Echocardiography is a valuable diagnostic tool as it is non-invasive and cost-effective and its widespread use should be enhanced to diagnose heart diseases in a large number of patients and in reasonable time. Most patients present late and majority need of surgical or interventional treatment, which is still not readily available. Untreated heart diseases contribute substantially to morbidity and mortality during infancy and childhood. Adequate cardiac services should be established and strengthened.<sup>14</sup> Improving care of children with congenital heart disease is an uphill task, but needs to be addressed.<sup>2</sup>

## CONCLUSION:

Cardiac evaluation should be done in all cases of repeated chest infection and failure to thrive. CHD needs regular monitoring to permit optimal growth and development. Early diagnosis and timely intervention will reduce the Morbidity and mortality to a large extent.

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